



Analysis for the presence of Cocaine and Tetrahydrocannabinol on Paper Currency

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Introduction

- Marijuana and cocaine usage has been an ongoing issue for years
- Their presence on paper currency can be found due to handling of the drugs prior to using the cash (1)
- The objective of this study is to analyze paper currency from local stores for the presence of cocaine and THC



Methods

Proof of Concept

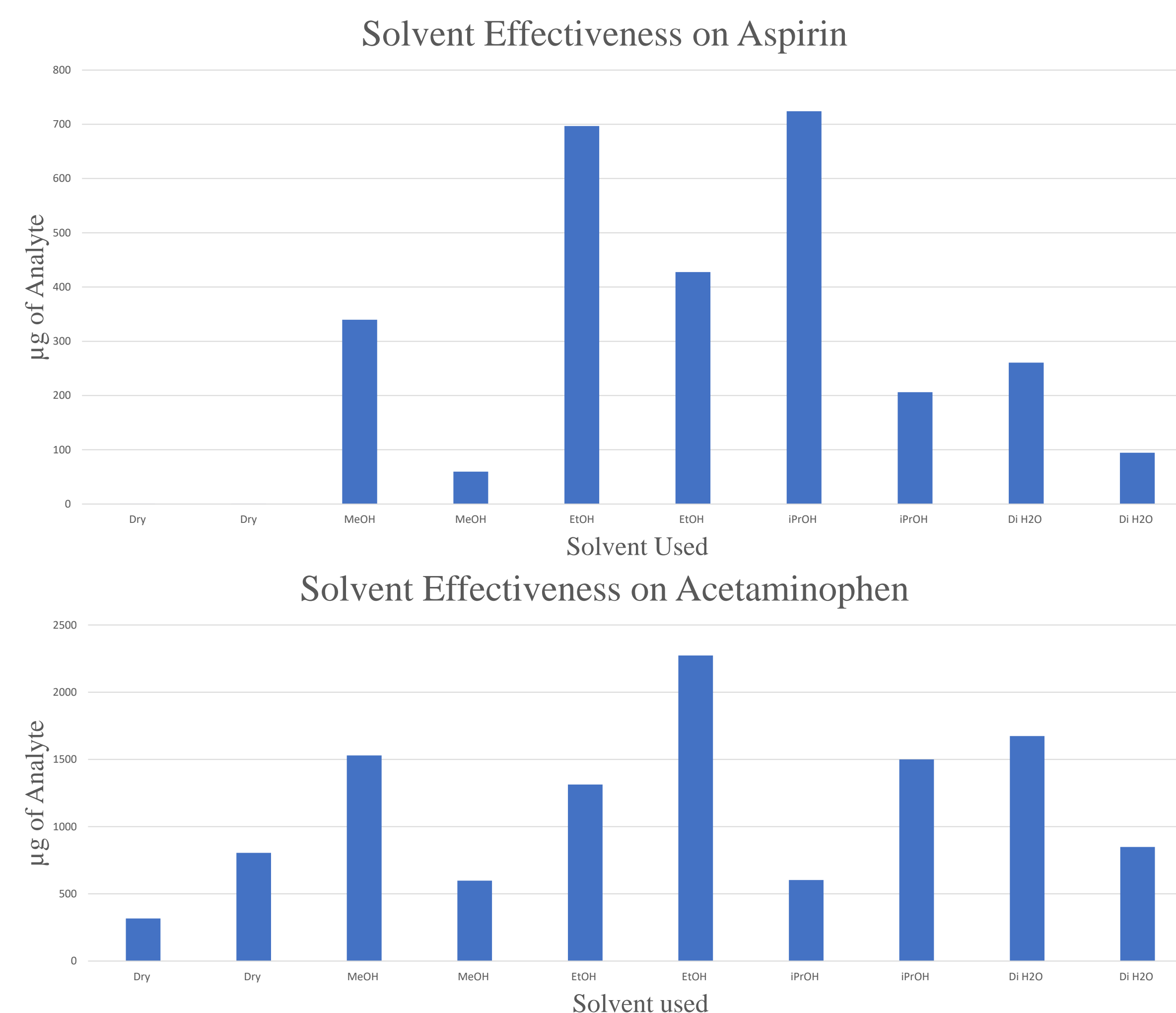
- Swabbing methods were tested with aspirin and acetaminophen on paper and dollar bills
- Swabs included dry or wet with different solvents: DI water, methanol, ethanol, and isopropyl alcohol
- HPLC analysis was performed using 0.1% formic acid in water (A) and 100% acetonitrile (B)
 - 0-3 minutes 50% A, 50% B
 - 6-7 minutes 35% A, 65% B
 - 9 minutes 30% A, 70% B
 - 10 minutes 20% A, 80% B
 - 11 minutes 0% A, 100% B

Analysis of Paper Currency

- Cash was collected from a Marathon gas station, Austin's Cigar Lounge, and Walmart
- Paper currency of various denominations were then swabbed with ethanol
- HPLC analysis was performed using water with 0.1% formic acid (A) and methanol with 0.05% formic acid (B)
 - 0 minutes 85% A, 15% B
 - 7-8 minutes 30% A, 70% B
 - 8-10 minutes 10% A, 90% B
- LC-MS/MS was performed using 0.1% formic acid in water (A) and 0.1% formic acid in acetonitrile (B) with a flow rate of 0.5 mL/min. This was found from Agilent (2)
 - 0 minutes 95% A, 5% B
 - 1 minute 5% A, 95% B
 - 6 minutes 5% A, 95% B
 - 9 minutes 0% A, 100% B

Results

- After analysis of the paper currency with the HPLC, non-detectable levels of cocaine and THC were found
- Further analysis via LC-MS/MS showed slight signs of cocaine on 6 bills total as well as the spike sample



Location	Peak Area	Concentration
G1.1	64997	0.343049105
G1.2	40681	0.237987427
G1.3	28184	0.183991877
G5.1	12701	0.117094774
G5.2	19982	0.148553652
G5.3	16290	0.132601698
Cocaine Bill	285666	1.296489447

G refers to bills collected from the Marathon gas station. It is also important to note that these values were found using a modified trend line.

Discussion

- Ethanol was found to be the best solvent for swabbing
- Analysis via LC-MS/MS showed no traces of THC
- Cocaine was found on bills collected from the Marathon gas station as well as the spiked bill
- This shows some correlation between the usage of smaller bills and projected drug usage overall

Conclusion

- With no THC found and minimal amounts of cocaine, continuing research on this subject would be valuable
- The results show that these methods do work, but it needs refining before continuing
- Increased accuracy on the standard curves would be beneficial in going forward
- This will help ensure that the results will be more accurate and acceptable

References

- Levins, E. S.; Lavins, B. D.; Jenkins, A. J. *Cannabis (Marijuana) Contamination of United States and Foreign Paper Currency*. *Journal of Analytical Toxicology* 2004. 28. 439-442.
- Zumwalt, M.C. Moore, C. *Rapid Analysis of Drugs of Abuse by LC/Triple Quadrupole Mass Spectrometry*. Agilent Technologies. 1-8.

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